SMART HOME SECURITY
USING ARDUINO UNO AND MOBILE APPLICATION

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Bachelor of Software Engineering

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SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis/project* and in my opinion, this thesis/project* is adequate in terms of scope and quality for the award of the degree of S Bachelor of Software Engineering.

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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Kes pecah rumah semakin banyak berlaku di Malaysia. Setiap tahun mesti kes pecah rumah semakin kedengaran di media sosial dan kaca televisyen. Kebanyakan kes pecah rumah berlaku disebabkan beberapa faktor. Salah satu faktor kelemahan sistem kunci. Kebanyakan pengguna di Malaysia menggunakan kunci mangga untuk kunci. Kunci mangga mempunyai kelebihan iaitu mudah kunci dan kunci unik setiap mangga tetapi ia mempunyai keburukan iaitu mudah dipecahkan dan mudah membuat kunci tambahan. Kunci mangga mudah dipecahkan oleh perompak disebabkan mungkin mereka mempelajari daripada YouTube. Oleh itu, untuk mengatasi masalah ini, projek ini mencadangkan sebuah sistem yang boleh pengguna mengunci pintu rumah dengan mudah dan lebih selamat. Objektif untuk membina sistem ini adalah untuk mengunci pintu rumah dengan menggunakan aplikasi android atau suara dan untuk mengawal pintu rumah dengan menggunakan telefon mudah alih yang membantu pengguna untuk melihat pintu rumah bila-bila masa dan di mana sahaja. Pembangunan Aplikasi Rapid adalah kaedah yang digunakan untuk membangunkan aplikasi ini. Metodologi RAD terdiri daripada empat peringkat utama, pertama adalah peringkat perancangan keperluan, peringkat reka bentuk, peringkat pembinaan, dan terakhir adalah peringkat henti ganti. Selepas aplikasi telah dibangunkan, pelanggan akan diberi ujian penerimaan pengguna (UAT) untuk memastikan bahawa semua fungsi mengikut keperluan tanpa sebarang kesilapan. Ujian UAT akan memastikan aplikasi itu memenuhi semua objektif dan boleh digunakan untuk menyelesaikan masalah semasa mengenai sekuriti rumah. Berdasarkan pengujian sistem, pengguna mengunci pintu rumah dengan mudah dengan menggunakan Sistem kepintaran rumah. Ia berharap sistem yang dicadangkan akan memberi manfaat kepada pihak yang berminat.

ABSTRACT

Home bursts are growing in Malaysia. Every year home-breaking cases are increasingly being heard in social media and television. Most home-based cases occur due to several factors. One of the key system weaknesses. Most users in Malaysia use lock keys for the lock. The mango lock has the advantage of being simple keys and unique keys of each mango but it has its disadvantages that are easy to crack and easy to create extra keys. Mango keys are easily broken by pirates as they may learn from YouTube. Therefore, to address this problem, this project proposes a system that allows users to lock the door easily and safely. The objective of building this system is to lock the door of the house using android or voice app and to control the door of the house using a mobile phone that helps the user to see the door of the house anytime and anywhere. Rapid Application Development is the method used to develop this application. The RAD methodology consists of four main stages, the first is the planning stage of the need, the design stage, the stages of construction, and the last is the stallion level. After the application has been developed, customers will be given a user acceptance test (UAT) to ensure that all functions are in accordance with the requirements without any mistake. The UAT test will ensure that the application meets all objectives and can be used to solve current problems regarding home security. Based on system testing, users lock the door easily by using the Home Intelligence System. It hopes that the proposed system will benefit the interested parties.

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LIST OF ABBREVIATIONS

RAD	Rapid Application Development
SDLC	Software Development Life Cycle
UAT	User Acceptance Testing
SRS	Software Requirement Specification
SDD	Software Design Description
SHSS	Smart Home Security
IDE	Integrated Development Environment

CHAPTER 1

INTRODUCTION

1.1 Background Project

Based on journal, one year after the past edition of the Cluster book 2012 it can be clearly stated that the Internet of Things (IoT) has reached many different players and gained further recognition. There are many areas of things replace with IoT such as Smart Cities, Smart Car, Smart Home and assisted living, Smart Industries, Public safety, Energy & environmental protection, Agriculture and Tourism as part of a future IoT Ecosystem. IoT means a concept and a paradigm that considers pervasive presence in the environment of a variety of things/objects that through wireless and wired connections and unique addressing schemes are able to interact with each other and cooperate with other things/objects to create new applications/services and reach common goals (Gershenfeld, Krikorian, & Cohen, 2004). IoT is a device that can be controlled through wireless and wired connection by other device such as mobile device or computer device.

Smart Home is term commonly used as a residence appliances, lighting, heating, air conditioning, TVs, computers, entertainment audio & video systems, security, and camera systems that can communicate with one another and can be controlled remotely by a time schedule, from any room in the home, as well as remotely from any location in the world by phone or internet(SmartHomeUSA, 2014). Therefore, the security more important in the Smart Home system. This make that home more secure and effective protected the home. When you forget to lock your home, you need come back to lock it. This met waste your time to go work or anywhere.

In Malaysia, statistics of crime case have been increasing to 4.6% until April 2016. Based on Utusan Online, 38,877 cases have been recorded from January to April 2016 say by "Pengarah Jabatan Pencegahan Jenayah dan Keselamatan Komuniti (JPJKK) Bukit Aman, Datuk Acryl Sani Abdullah Sani".(Online, 2017) Based on that, mostly the crime is (58 % from 38,877) robbery home with 6,662 cases. This shows less security home in Malaysia. Maybe they think only key can made their home secure or smart home security costly their salary. This make easy robber to robbery their home because it common key in Malaysia and it can be anyone be robber. The way to destroy key have shown at YouTube. Many responsible have be involved such government, NGO, community and people. Government have doing some talk about home security and same with community but the people don't take this more crucial. So, they need cheap and secure system to enhance their security.

My project is entitled Smart Home Security. It was developed in mobile application, Raspberry pi and Arduino. This system was created to be used in daily life by user. They don't need key in the password at the device to lock their home security. They can lock their home by mobile application and they can doing that at everywhere as long they have internet. The mobile application connects the Raspberry pi to give instruction / signal so Raspberry pi can be doing their job. The Raspberry pi asking user to stand front in camera to detect their face for unlock or lock the home door. They can be changing the password in mobile application. So, by using this system, they don't worry about home security and easier to manage the system to make secure.

1.2 Problem Statement

The first problem that can be addressed are user don't lock their home door. They are human and every human made a mistake so there have possibilities they don't lock their home door (Chitnis, Deshpande, & Shaligram, 2016). For example, they forget to lock their home door because they rushing to go work so many reason why they forget lock their home door such as they have family member in the house.

The second problem that can be addressed are security are low. They have use padlock to lock their home. This is low security because it can be broken by some tools. The crime can learn how brake the padlock in YouTube. For example, The Truth about

to open padlock. It is easy to open with some tools. They need some advanced feature like mobile phone to secure their home.

The third problem is that user don't used the security system because it may have costly (Chitnis et al., 2016). This made user have don't thinks to upgrade their security and waste money if they invest in home security to make their home secure. Mostly, they invest their money buy their life such as house, car, electric, water etc. The advanced security system has differences prices with difference features. There have cheaper with less feature of security and otherwise expensive with more feature of security. Cost of living increase of one reason they given so they be careful to invest anything and people live in rural area don't have big salary or want to be install advanced security system in their home.

1.3 Goal and Objective

The goal of this project is to develop an android application ,Raspberry Pi , Arduino system for smart home security that can manage their information and their user, lock the locker in mobile application and also lock or unlock in device by using face recognition.

The purpose of this project:

i. To improve the door lock security system by using face recognition.

ii. To decrease the burden of the user.

iii. To developing Raspberry pi system with face recognition.

1.4 Scope

The main scopes of this project:

i. The user uses mobile application which require password to lock or open their door.

ii. The system can recognise face user by using face recognition.

iii. The system need internet to connect with user because it need to give notification from mobile application by using internet and get signal to lock the door.

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